

FY16755PCTUS

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Nobuyuki Kanno et al  
Appl. No. : Unknown  
Filed : Concurrently Herewith  
For : NURSING TYPE OF ELECTRIC  
MOTOR -OPERATED WHEELCHAIR  
Examiner : Unknown  
Group Art Unit: Unknown

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Preliminary to the examination of this application on its merits, please amend this application as follows:

**IN THE CLAIMS**

Amend Claims 1 through 23 as follows:

1. (Amended) A pushing type of electric motor-operated wheelchair, a frame provided with a seat for a patient, at least one wheel journaled by said frame and driven by an electric motor carried by said frame, a bar handle extending upward from a rearward portion of said frame and having a cross piece of a double member structure consisting of a fixed member attached to said frame and an external member disposed along at least upper side portion of said fixed member; a detecting means interposed between said fixed member and said external member to detect control information based on an external force applied to said external

member, and a control means for controlling said electric motor to produce assisting power commensurate with the control information detected by said detecting means.

2. (Amended) A pushing type of electric motor-operated wheelchair according to claim 1, wherein the detecting means comprises a displacement detecting means for detecting control information, namely relative displacement between the fixed member and the movable member, and the control means is provided to control the electric motor to produce assisting power commensurate with the detected displacement.

3. (Amended) A pushing type of electric motor-operated wheelchair according to claim 2, wherein the displacement detecting means is disposed in the center, with respect to the wheelchair width, of at least one of the fixed member and the movable member, and guides are provided on right and left sides of said displacement detecting means to restrict up and down movements and to permit forward and reverse movements of said movable member.

4. (Amended) A pushing type of electric motor-operated wheelchair according to claim 2 wherein the displacement detecting means is disposed in the center, with respect to the wheelchair width, of at least one of the fixed member and the movable member, and grip members are provided on right and left sides of said movable member.

5. (Amended) A pushing type of electric motor-operated wheelchair according to claim 4, wherein the right and left grip members are positioned symmetrically apart from the longitudinal centerline of the wheelchair and sloping obliquely up inward to the center in the wheelchair width direction from right and left ends.

6. (Amended) A pushing type of electric motor-operated wheelchair according to claim 2 wherein the assist power controlling means controls the electric motor to move forward according to the magnitude of the relative displacement between the fixed member and the movable member caused by pressing the upper side portion of the bar handle, and controls the driving motor to move backward when a separately provided first operator is turned on.

7. (Amended) A pushing type of electric motor-operated wheelchair according to claim 2, wherein the assist power controlling means controls the electric motor to move forward or backward according to the magnitude of the relative displacement between the fixed member and

the movable member of the bar handle, and controls said electric motor to stop irrespective of the value detected with the displacement detecting means when a separately provided second operator is turned on.

8. (Amended) A pushing type of electric motor-operated wheelchair according to claim 6 wherein operators selected from the group comprising a reverse switch, a power switch, and a speed regulation device and displays selected from the group comprising a power display, a display for indicating the necessity of charging, and an anomaly display are collectively disposed in the center, with respect to the wheelchair width, of the external member of the bar handle.

9. (Amended) A pushing type of electric motor-operated wheelchair according to claim 1, wherein the detecting means comprises a load detecting means for detecting the magnitude of the load applied to the external member and the control means controls the electrical motor so as to produce assist power commensurate with the detected load.

10. (Amended) A pushing type of electric motor-operated wheelchair according to claim 9, wherein the detecting means comprises a magnetostriction sensor for detecting the load and a magnetostriction sensor for compensating the output from the load-detecting magnetostriction sensor.

11. (Amended) A pushing type of electric motor-operated wheelchair according to claim 10, wherein the load-detecting magnetostriction sensor and the output-compensating magnetostriction sensor are disposed to face each other and a damping member is interposed between the two sensors.

12. (Amended) A pushing type of electric motor-operated wheelchair according to claim 10, wherein a load transmitting member for transmitting load to the load-detecting magnetostriction sensor is attached to the external member in such a manner that its position relative to the load-detecting magnetostriction sensor may be adjusted.

13. (Amended) A pushing type of electric motor-operated wheelchair according to claim 12, wherein an indicator displays the relative positions of the load transmitting member and the load-detecting magnetostriction sensor.

14. (Amended) A pushing type of electric motor-operated wheelchair according to claim 1, wherein the detecting means outputs control information based on the external force acting on the external member in a horizontal direction.

15. (Amended) A pushing type of electric motor-operated wheelchair according to claim 1 wherein the external member is provided with a handle cover disposed in the center of the wheelchair width, and right and left grip portions extend respectively in right and left directions from said handle cover, a top surface of said handle cover comprises an operation panel portion containing at least one switch, on one side in the wheelchair width direction of the handle cover's top surface being depressed below said operation panel portion to form a rotary switch placing portion and a rotary switch disposed in said rotary switch placing portion.

16. (Amended) A pushing type of electric motor-operated wheelchair according to claim 1, wherein the external member is provided with a handle cover disposed in the wheelchair width center, and right and left grip members extend respectively from right and left from said handle cover, a top surface of said handle cover is formed as an operation panel portion, a push switch mounted in a switch hole formed in said operation panel portion and projecting upward from said top surface of said operation panel portion, and a switch circumferential wall formed around said switch hole so as to surround said push switch and lying substantially flush with a top surface of said push switch.

17. (Amended) A pushing type of electric motor-operated wheelchair comprising a frame provided with a rearwardly placed push handle a wheel journaled by said frame, a motor for driving said wheel, a human force detecting means for detecting human force when said push handle is pushed forward, an operator control for propelling said wheelchair backward, and a motor control for driving said motor forward according to the detected value coming from said human force detecting means and for driving said motor backward when said operator is turned on.

18. (Amended) A pushing type of electric motor-operated wheelchair comprising a frame provided with a rearwardly placed push handle a wheel journaled by said frame, a motor for driving said wheel, a human force detecting means for detecting human force from relative

movement amount when said push handle is pushed forward, a zero point detecting means for outputting a zero point signal when the relative movement amount of said push handle is a specified value, and a motor control means for controlling said motor using a reference value which is the value detected with said human force detecting means when said zero point signal is outputted.

19. (Amended) A pushing type of electric motor-operated wheelchair according to claim 18, wherein the motor control means controls the motor according to a first and a second insensible zones, said first insensible zone comprising the area where the relative movement amount of the push handle is smaller than the specified value, and with the second insensible zone greater than the specified value to an upper limit greater than the specified value.

20. (Amended) A pushing type of electric motor-operated wheelchair according to claim 19, wherein the motor control means drives the motor forward according to the value detected with the human force detecting means when the detected value is beyond the second insensible zone, makes the output of the motor zero when the detected value is in the second insensible zone, and causes the motor to function as a generator brake when the detected value is in the first insensible zone.

21. (Amended) A pushing type of electric motor-operated wheelchair according to claim 17, wherein the push handles are made up of right and left leg portions secured to the frame and extending upward and an operating section interconnecting the upper ends of the right and left leg portions, a movable member supported for back-and-forth relative movement in said operating section, said movable member projecting and retracting back and forth through slits formed in said operating section, and the human force detecting means detects the human force as said movable member moves back and forth.

22. (Amended) A pushing type of electric motor-operated wheelchair according to claim 21, wherein right and left movable members are disposed in the right and left grip members of the operating section, said right and left movable members being interconnected through a connecting member, and the human force detecting means detects the relative movement amount of the approximate central portion of said connecting member.

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23. (Amended) A pushing type of electric motor-operated wheelchair according to claim 17, wherein the push handles are made up of right and left leg portions secured to the frame of the wheelchair and extending upward and grips attached to the top end portions of the respective leg portions, at least one of said right and left grips is capable of relative back-and-forth movement, and the human force detecting means detects the human force from the relative movement amount of the movable grip.

Add the following new claims:

24. (New) A pushing type of electric motor-operated wheelchair according to claim 7 wherein operators selected from the group comprising a reverse switch, a power switch, and a speed regulation device and displays selected from the group comprising a power display, a display for indicating the necessity of charging, and an anomaly display are collectively disposed in the center, with respect to the wheelchair width, of the external member of the bar handle.

25. (New) A pushing type of electric motor-operated wheelchair according to claim 15 wherein the rotary switch is provided with operation tongue portions projecting toward the grip member.

26. (New) A pushing type of electric motor-operated wheelchair according to claim 18 wherein the push handles are made up of right and left leg portions secured to the frame of the wheelchair and extending upward and grips attached to the top end portions of the respective leg portions, at least one of said right and left grips is capable of relative back-and-forth movement, and the human force detecting means detects the human force from the relative movement amount of the movable grip

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**REMARKS**

This preliminary amendment is being made to bring the claims into conformity with the practice in this country. An action on the merits is most courteously solicited.

Respectfully submitted,

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**VERSION WITH MARKINGS SHOWING CHANGES MADE**

1. (Amended) A [nursing] pushing type of electric motor-operated wheelchair[, characterized by being provided with:] a frame provided with a seat for a patient, at least one wheel journalled by said frame and driven by an electric motor carried by said frame, a bar handle extending upward from [the rear parts of right and left side frames to form a gate shape in] a rearward portion of said frame and having a cross piece of a double member structure [made up] consisting of a fixed member attached to [the rear parts of the right and left side frames] said frame and an external member disposed along at least upper side portion of [the] said fixed member; a detecting means interposed between [the] said fixed member and [the] said external member to detect control information based on [the] an external force applied to [the] said external member[;], and a control means for controlling [a driving]said electric motor to produce assisting power commensurate with the [detected] control information detected by said detecting means.

2. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 1, [characterized in that] wherein [the bar handle is formed in a double structure made up of a gate-shaped fixed member of a gate shape, attached to the rear parts of the right and left side frames and a movable member disposed for relative displacement along at least upper side portion of the fixed member,] the detecting means comprises a displacement detecting means [is disposed to detect] for detecting control information, namely relative displacement between the fixed member and the movable member, and [a] the control means [is provided to control [a driving] the electric motor to produce assisting power commensurate with the detected displacement.

3. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 2, [characterized in that] wherein the displacement detecting means is disposed in the center, with respect to the [vehicle] wheelchair width, of at least one of the fixed member and the movable member, and guides are provided on right and left sides of [the] said displacement



detecting means to restrict up and down movements and to permit forward and reverse movements of [the] said movable member.

4. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 2 [or 3, characterized in that] wherein the displacement detecting means is disposed in the center, with respect to the [vehicle] wheelchair width, of at least one of the fixed member and the movable member, and grip members are provided on right and left sides of [the] said movable member.

5. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 4, [characterized in that] wherein the right and left grip members [attached to the movable member] are positioned symmetrically apart from the longitudinal centerline of the [vehicle] wheelchair and sloping obliquely up inward to the center in the [vehicle] wheelchair width direction from right and left ends.

6. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to [one of claims 2 to 5, characterized in that] claim 2 wherein the assist power controlling means controls the [driving] electric motor to move forward according to the magnitude of the relative displacement between the fixed member and the movable member caused by pressing the upper side portion of the bar handle, and controls the driving motor to move backward when a separately provided first operator is turned on.

7. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to [one of] claim[s] 2 [to 5], [characterized in that] wherein the assist power controlling means controls the [driving] electric motor to move forward or backward according to the magnitude of the relative displacement between the fixed member and the movable member of the bar handle, and controls [the driving] said electric motor to stop irrespective of the value detected with the displacement detecting means when a separately provided second operator is turned on.

8. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 6 [or 7, characterized in that] wherein operators [including] selected from the group comprising a reverse switch, a power switch, and a speed regulation device[, etc.] and displays [including] selected from the group comprising a power display, a display for indicating the

necessity of charging, and an anomaly display[, etc.] are collectively disposed in the center, with respect to the [vehicle] wheelchair width, of the external member of the bar handle.

9. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 1, [characterized in that] wherein the detecting means comprises a load detecting means for detecting the magnitude of the load[, as the control information,] applied to the external member [is disposed between the fixed member and the external member,] and [a] the control means [is provided to control the] controls the [driving] electrical motor so as to produce assist power commensurate with the detected load.

10. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 9, [characterized in that] wherein the detecting means comprises a magnetostriction sensor for detecting the load and a magnetostriction sensor for compensating the output from the load-detecting magnetostriction sensor [are provided].

11. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 10, [characterized in that] wherein the load-detecting magnetostriction sensor and the output-compensating magnetostriction sensor are disposed to face each other and a damping member is interposed between the two sensors.

12. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim [9 or] 10, [characterized in that] wherein a load transmitting member for transmitting load to the load-detecting magnetostriction sensor is attached to the external member in such a manner that its position relative to the load-detecting magnetostriction sensor may be adjusted.

13. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 12, [characterized in that] wherein an [adjusting means] indicator displays [that lights up or goes out depending on] the relative positions of the load transmitting member and the load-detecting magnetostriction sensor [is provided].

14. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 1, [characterized in that] wherein the detecting means outputs control information based on the external force acting on the external member in a horizontal [or slightly down forward] direction.

15. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 1 [characterized in that] wherein the external member is provided with a handle cover disposed in the center of [vehicle] the wheelchair width, and right and left grip portions [extending] extend respectively in right and left directions from [the] said handle cover, [the] a top surface of [the] said handle cover [is formed to be] comprises an operation panel portion [for placing various] containing at least one switch[es], on one side in the [vehicle] wheelchair width direction of the handle cover's top surface [is formed] being depressed below said operation panel portion to form a rotary switch placing portion [to be a step lower than the operation panel portion,] and a rotary switch [is] disposed [rotatably] in [the] said rotary switch placing portion[, and the rotary switch is provided with operation tongue portions projecting toward the grip member].

16. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 1, [characterized in that] wherein the external member is provided with a handle cover disposed in the [vehicle] wheelchair width center, and right and left grip members [extending] extend respectively from right and left from [the] said handle cover, [the] a top surface of [the] said handle cover is formed [to be] as an operation panel portion [for placing various switches], a push switch [is disposed] mounted in a switch hole formed in [the] said operation panel portion [such that it projects] and projecting upward from [the] said top surface of [the] said operation panel portion, and a switch circumferential wall [is] formed [on the circumferential edge of the] around said switch hole so as to surround [the] said push switch and lying substantially [approximately] flush with [the] a top surface of [the] said push switch.

17. (Amended) A [nursing] pushing type of electric motor-operated wheelchair comprising a frame provided with a rearwardly placed push handle [for nursing, attached to the body of the wheelchair propelled as driven with] a wheel journalled by said frame, a motor for driving said wheel, [characterized by being provided with:] a human force detecting means for detecting human force when [the] said push handle is pushed forward[;], an operator control for propelling [the vehicle body] said wheelchair backward[;], and a motor control [means] for driving [the] said motor forward according to the detected value coming from [the] said human

force detecting means and for driving [the] said motor backward when [the] said operator is turned on.

18. (Amended) A [nursing] pushing type of electric motor-operated wheelchair comprising a frame provided with a rearwardly placed push handle [for nursing, attached to the body of the wheelchair propelled as driven with] a wheel journalled by said frame, a motor for driving said wheel, [characterized by being provided with:] a human force detecting means for detecting human force from relative movement amount when [the] said push handle is pushed forward[;], a zero point detecting means for outputting a zero point signal when the relative movement amount of [the] said push handle is a specified value[;], and a motor control means for controlling [the] said motor using a reference value which is the value detected with [the] said human force detecting means when [the] said zero point signal is outputted.

19. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 18, [characterized in that] wherein the motor control means controls the motor according to a first and a second insensible zones, [with the]said first insensible zone [defined to be one in which]comprising the area where the relative movement amount of the push handle is smaller than the [above] specified [movement amount]value, and with the second insensible zone [defined to be one ranging from the above]greater than the specified [movement amount]value to an upper limit [of an insensible zone which is] greater than the specified [movement amount]value.

20. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 19, [characterized in that] wherein the motor control means drives the motor forward according to the value detected with the human force detecting means when the detected value is beyond the second insensible zone, makes the output of the motor zero when the detected value is in the second insensible zone, and causes the motor to function as a generator brake when the detected value is in the first insensible zone.

21. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to [one of] claim[s] 17 [to 20], [characterized in that] wherein [,] the push handles are made up of right and left leg portions secured to the [right and left] the frame[s of the vehicle body] and

extending upward and an operating section interconnecting the upper ends of the right and left leg portions, a movable member [capable of making]supported for back-and-forth relative movement [is disposed] in [the] said operating section, [the] said movable member [is adapted to be capable of] projecting and retracting back and forth through slits formed in [the] said operating section, and the human force detecting means detects the human force as [the] said movable member moves back and forth.

22. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 21, [characterized in that] wherein right and left movable members are disposed in the right and left grip members of the operating section, [the] said right and left movable members [are] being interconnected through a connecting member, and the human force detecting means detects the relative movement amount of the approximate central portion of [the] said connecting member.

23. (Amended) A [nursing] pushing type of electric motor-operated wheelchair according to claim 17 [or 18], [characterized in that] wherein the push handles are made up of right and left leg portions secured to the [right and left] frame[s] of the [vehicle body]wheelchair and extending upward and grips attached to the top end portions of the respective leg portions, at least one of [the] said right and left grips is [made] capable of [making] relative back-and-forth movement, and the human force detecting means detects the human force from the relative movement amount of the movable grip.

24. (New) A pushing type of electric motor-operated wheelchair according to claim 7 wherein operators selected from the group comprising a reverse switch, a power switch, and a speed regulation device and displays selected from the group comprising a power display, a display for indicating the necessity of charging, and an anomaly display are collectively disposed in the center, with respect to the wheelchair width, of the external member of the bar handle.

25. (New) A pushing type of electric motor-operated wheelchair according to claim 15 wherein the rotary switch is provided with operation tongue portions projecting toward the grip member.

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26. (New) A pushing type of electric motor-operated wheelchair according to claim 18 wherein the push handles are made up of right and left leg portions secured to the frame of the wheelchair and extending upward and grips attached to the top end portions of the respective leg portions, at least one of said right and left grips is capable of relative back-and-forth movement, and the human force detecting means detects the human force from the relative movement amount of the movable grip

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MOTOR -OPERATED WHEELCHAIR  
Examiner : Unknown  
Group Art Unit: Unknown

TRANSMITTAL OF SUPPLEMENTAL DRAWINGS

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Enclosed herewith are three sheets of drawings containing Figures 2, 3 and 25, which were the figures that were originally intended for filing in the PCT application and which are based upon Japanese priority application 2000-214347. When the original PCT application was submitted, the wrong copies of these figures were filed, these being the corresponding figures from Japanese Application 2000-51111.

We would like to have these added sheets considered as part of the original filing in this application so that the correct drawings will appear. Efforts are being made to correct the original PCT filing in Japan to make this substitution.

Respectfully submitted,

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